U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Cynomys gunnisoni*

COMMON NAME: Gunnison's prairie dog (montane (northeastern) portion of range)

LEAD REGION: Region 6

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION:
___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
__X__ Continuing candidate
___ Non-petitioned
__X__ Petitioned - Date petition received: **February 23, 2004**
___ 90-day positive - FR date:
__X__ 12-month warranted but precluded - FR date: **February 5, 2008**
___ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a) Is listing warranted (if yes, see summary of threats below)? **Yes**

b) To date, has publication of a proposal to list been precluded by other higher priority listing actions? **Yes**

c) Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

___ Listing priority change
Former LP: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): **February 5, 2008**
___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to

conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Endangered Species Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Mammals; Family Sciuridae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Montane portions of central and south central Colorado and north central New Mexico

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Colorado and New Mexico

LAND OWNERSHIP: Approximately 44% of the northeastern (montane) portion of the range occurs on private lands, 4% on state lands, 50% on Federal lands, and 2% on Tribal lands/Bureau of Indian Affairs (BIA).

LEAD REGION CONTACT: Justin Shoemaker, 303-326-4214

LEAD FIELD OFFICE CONTACT: Dan Reinkensmeyer, 970-243-2778, ext 39

BIOLOGICAL INFORMATION

Species Description

Gunnison's prairie dog (GPD) (*Cynomys gunnisoni*) adults vary in length from 309 to 373 millimeters (12 to 15 inches) and weigh 650 to 1,200 grams (23 to 42 ounces), with males averaging slightly larger than females (Hall 1981, p. 414; Pizzimenti and Hoffman 1973, pp. 1-2). The dorsal color is yellowish buff intermixed with blackish hairs. The top of the head, sides of cheeks, and "eyebrows" are noticeably darker than the dorsum (Hall 1981, pp. 414-415; Pizzimenti and Hoffman 1973, pp. 1-2). The species differs from black-tailed prairie dogs (*C. ludivicianus*) in having a much shorter and lighter colored tail, and from white-tailed prairie dogs (*C. leucurus*) and Utah prairie dogs (*C. parvidens*) in having grayish-white hairs in the distal half of the tail rather than pure white (Hoogland 1995, p. 8; Pizzimenti and Hoffman 1973, pp. 1-2). The candidate entity discussed herein includes GPDs occupying the montane portions of central and south central Colorado and north central New Mexico (the northeastern portion of the species' range).

Taxonomy

The GPD is a member of the Sciuridae family, which includes squirrels, chipmunks, marmots, and prairie dogs. Prairie dogs constitute the genus *Cynomys*. Taxonomists currently recognize five species of prairie dogs belonging to two subgenera, all in North America (Goodwin 1995, p. 100). The white-tailed subgenus, *Leucocrossuromys*, includes Utah prairie dogs (*C. parvidens*), white-tailed prairie dogs (*C. leucurus*), and GPDs (Goodwin 1995, p. 100). The

black-tailed subgenus, *Cynomys*, consists of Mexican (*C. mexicanus*) and black-tailed prairie dogs (Goodwin 1995, pp. 100-101). The number of chromosomes for the GPD (2n = 40) is different from all other prairie dog species (2n = 50), suggesting the species' uniqueness and its early evolutionary divergence from other prairie dog species (Pizzimenti 1975, pp. 11-13).

The GPD has sometimes been divided into two subspecies: *Cynomys gunnisoni gunnisoni* and *C. g. zuniensis* (Hollister 1916, p. 29). We currently regard the GPD as a single species because the most recent published analyses (Goodwin 1995, pp. 100, 101, 110; Pizzimenti 1975, pp. 11, 15, 63) do not support subspecies designation. Genetic analysis (Hafner 2004, p. 6; Hafner et al. 2005, p. 2) suggests past geographic isolation, followed by limited mixing in regions coincident with the recognized borders of the two purported subspecies. Over the past 2 years the Colorado Division of Wildlife (CDOW) has been conducting an ongoing GPD genetics study. The CDOW collected samples from colonies located within both of the purported subspecies boundaries. Preliminary results from this study strongly support the existence of two separate subspecies of GPD (CDOW 2010a, p. 3). To date, samples have only been collected in the portion of the species range located in Colorado. In 2010, samples will be collected in Utah, Arizona, and New Mexico, encompassing the entire range of the species. Although these analyses are still preliminary, there is increasing evidence for GPD subspecies designation. We will reevaluate the subspecies designation issue when the CDOW releases its final genetics report that includes data from the entire species range.

Habitat/Life History

The GPD habitat includes level to gently sloping grasslands and semi-desert and montane shrublands, at elevations from 6,000 to 12,000 feet (1,830 to 3,660 meters) (Bailey 1932, p. 125; Findley et al. 1975, p. 133; Fitzgerald et al. 1994, p. 183; Pizzimenti and Hoffman 1973, p. 1; Wagner and Drickamer 2002, p. 4). The GPDs occupy grass–shrub areas in low valleys and mountain meadows within this habitat (Seglund et al. 2005, p. 12). Grasses are the most important food item, with forbs, sedges, and shrubs also occasionally used (Pizzimenti and Hoffman 1973, p. 3; Shalaway and Slobodchikoff 1988, p. 840). The GPDs in this portion of the range are limited by pronounced physiographic barriers (Pizzimenti and Hoffman 1973, p. 1), including the Uncompahgre Plateau and San Juan Mountains in Colorado and Utah, and the Sangre de Cristo, San Juan, and Jemez Mountain Ranges in New Mexico.

The GPDs are a colonial species, historically occurring in large colonies over large areas. Colonial behavior offers an effective defense mechanism by aiding in the detection of predators, but it also can play an important role in the transmission of disease (Antolin et al. 2002, p. 19; Biggins and Kosoy 2001, p. 911). Complexes of GPD colonies (metapopulations) expand or contract over time depending upon various natural factors (such as reproduction, food availability, and disease) and human-caused factors (such as chemical control and shooting). To substantially augment depleted populations or replace populations without human intervention, a metapopulation structure is required across the landscape so that migration between colonies is possible (Gilpin and Soule 1986, p. 24; Clark et al. 1982, pp. 574-575; Lomolino and Smith 2001, p. 938).

Historical Range/Distribution

The GPD range can be considered to occur in two separate range portions—higher elevations in the northeast part of the range and lower elevations elsewhere (Bailey 1932, pp. 125-127; Pizzamenti and Hoffman 1973, pp. 1-2; Hall 1981, p. 7; Knowles 2002, p. 4). We refer to these areas as montane and prairie, respectively, to differentiate them; however, we recognize that these terms are an oversimplification of the actual habitats present, and describe them in more detail below. The species exists in Arizona, Colorado, New Mexico, and Utah; however, the candidate entity discussed herein includes GPDs occupying the montane portions of central and south-central Colorado and north-central New Mexico (altogether, the northeastern portion of the species' range).

An approximate boundary dividing the montane and prairie range portions was established from several maps that recognize discrete range portions for each of the two purported subspecies, *Cynomys gunnisoni gunnisoni* and *C. g. zuniensis* (Hollister 1916, p. 24; Armstrong 1972, p. 139; Pizzimenti and Hoffman 1973, p. 2; Pizzimenti 1975, p. 4; Hall 1981). Maps that depict the geographic variation in GPD mitochondrial DNA in southern Colorado and northern New Mexico (Hafner 2004, p. 6; Hafner et al. 2005, p. 2) were used to improve the resolution of the montane and prairie boundary in this region, as these maps provide a boundary based on genetic differences between GPDs in the two range portions. Lastly, we used topographic maps to adjust the boundary on a finer scale along the mountain ranges and ridges of southern Colorado and northern New Mexico, because geography partly separates the GPD populations and allows limited overlap between the two range portions (Knowles 2002, p. 3; Hafner et al. 2005, p. 1).

The northeastern range (central and south-central Colorado, and north-central New Mexico) of the candidate entity discussed here consists primarily of higher elevation, cooler and more mesic plateaus, benches, and intermountain valleys. We call this portion "montane" for ease of reference, and it comprises approximately 40% of the total potential habitat within the entire species' range.

Current Range/Distribution

The current distribution of the candidate species includes central and south-central Colorado, and north-central New Mexico (Bailey 1932, pp. 125-127; Pizzamenti and Hoffman 1973, pp. 1-2; Hall 1981, p. 7; Knowles 2002, p. 4). Limited overlap occurs in the ranges of GPDs and black-tailed prairie dogs (*Cynomys ludovicianus*) in New Mexico (Goodwin 1995, p. 101; Sager 1996, p. 1), and GPDs and white-tailed prairie dogs (*Cynomys leucurus*) in Colorado (Knowles 2002, p. 5), but we have no evidence that interbreeding is occurring.

Within Colorado, the CDOW has designated individual population areas to identify where GPDs exist and where management activities should be focused. The montane portion of the species' range in Colorado is composed of the Gunnison, San Luis Valley, South Park, and Southeast population areas, located within portions of Park, Douglas, Lake, Gunnison, Delta, El Paso, Teller, Chaffee, Montrose, Fremont, Pueblo, Saguache, Ouray, Custer, Hinsdale, Huerfano, San Juan, Mineral, Rio Grande, Las Animas, Alamosa, Costilla, Conejos, and Jefferson Counties (FIGURE 1). By using CDOW (2007, p. 28) estimates of potential habitat, we determined that the montane range portion in Colorado comprises about 80% (6.9 million of 8.5 million acres (ac) (2.8 million of 3.4 million hectares (ha)) of the available GPD habitat in the state. However, of that 80%, only about 40% (73,861 of 182,237 ac (29,544 of 72,894 ha)) is currently occupied, based on our calculations using CDOW mapped area data (CDOW 2007, p. 3).

New Mexico also includes both montane and prairie habitat. The montane habitat is geographically connected to the montane portion of the GPD habitat in Colorado. Montane habitat comprises about 17% of the GPD habitat in New Mexico and includes portions of Colfax, Bernalillo, Sandoval, RioArriba, Taos, Mora, and Los Alamos Counties (FIGURE 1). We do not have accurate data on total acres of montane habitat in New Mexico, and therefore do not provide an acre estimate for the montane portion. We have no data on the percent occupancy in this habitat.

Population Estimates/Status

Most estimates of prairie dog populations in the available literature are expressed in terms of area (acres or hectares) of occupied habitat rather than in numbers of individuals, most likely because counting individuals is feasible only for small areas (Biggins et al. 2006, p. 94). Also, the number of animals present in a locality has been observed to vary with habitat, season, colony age, precipitation, forage, predation, disease, chemical control, shooting, and other factors (Knowles 2002, pp. 7-8); density of individuals typically ranges from 2 to 23 per acre (5 to 57 per hectare) (Fitzgerald et al. 1994, p. 184). Most prairie dog surveys do not result in a density estimate because of the associated effort and cost. Estimates of GPD occupied habitat provide one of the best available and most reasonable means of evaluating the status of the species across its range (see the Current Range/Distribution section above).

Since 2006, all states within the range of the species have applied occupancy modeling methodology to investigate the habitat occupied by GPDs. This newer technique yields estimates of the percentage of random plots occupied across the habitat range under consideration (MacKenzie et al. 2002, pp. 2248-2249; MacKenzie et al. 2003, pp. 2200-2201). These estimates are statistically based and, therefore, are considered more objective (Andelt et al. 2006, pp. 1-2; CDOW 2007, p. 19; Western Association of Fish and Wildlife Agencies 2007, p. 4).

A drawback to this method is that estimates of percent occupancy by GPDs are not directly comparable to estimates of occupied acres (including most historic estimates), because when a random plot is visited, only detection or non-detection (not acres occupied) is recorded by the observers. If mapping is not performed during a site visit, no information about colony or complex size or location is obtained.

The positive aspects of this method are statistical rigor, precision estimates, large-scale application in a single season, and trend analysis if performed over subsequent years. In addition, the results of individual surveys can be interpreted separately to assess prairie dog occupancy and document trends within specific areas of concern. Although only a single year (2007) of occupancy modeling results are available (with the exception of Colorado data from 2005 and 2007), we used these estimates, along with estimates of occupied areas, to assess the status and trends of the GPD in the montane portion of the range (see the Current Range/Distribution section above).

Occupancy modeling performed for Colorado in 2005 indicated a lower proportion of occupancy in the montane portion of the species' range within Colorado (3.2%) than in the prairie portion within Colorado (16.0%) (Andelt et al. 2006, p. 17; CDOW 2007, p. 19). When the study was repeated over the same plots in 2007, occupancy was again found to be lower (3.6%) in the montane range portion in Colorado than in the southwestern portion (18.3%) (CDOW 2007, p. 19). The CDOW will conduct occupancy monitoring again in 2010 (CDOW 2010a, p. 8).

SIGNIFICANT PORTION OF THE RANGE / DISTINCT POPULATION SEGMENT

We have determined that the species is not threatened or endangered throughout all of its range, but that the portion of the current range of the species located in central and south-central Colorado and north-central New Mexico (the northeastern portion of the range) represents a significant portion of the range where the GPD is warranted for listing under the Endangered Species Act. This portion of the range represents 40% of the entire range of the species, and this portion of the range is significant to the conservation of the species as a whole. We are not proposing listing the montane prairie dogs as a distinct population segment (DPS) under our Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act (61 FR 4722; February 7, 1996); although GPDs in montane habitat may be "markedly separate" from those in prairie habitat. We anticipate that future funding may become available for genetic, taxonomic, and range research to determine whether the two portions of the range represent separate subspecies or individual DPSs. The CDOW is continuing efforts begun in 2008 to collect genetic samples from GPDs and is currently analyzing those samples to provide additional insight into this question (CDOW 2010a, p. 1).

THREATS

A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Conservation principles indicate that smaller, more isolated populations are more vulnerable to extirpation (Barnes 1993, p. 34; Cully 1993, p. 43; Fitzgerald 1970, p. 78; Gilpin and Soule 1986, pp. 30-31; Miller et al. 1994, p. 151; Mulhern and Knowles 1995, p. 21; Wilcox and Murphy 1985, p. 883; Wuerthner 1997, p. 464). Lomolino et al. (2003, p. 116) found that persistence of GPD colonies increased significantly with larger colony size and decreased isolation. The populations within the montane portion of the range are smaller and more isolated. However, we found no studies or data that specifically assess the magnitude of the threats related to agriculture land conversions, urbanization, grazing, roads, and oil and gas leasing, and resulting fragmentation within the montane portion of GPD habitat.

After assessing the best available science on the magnitude and extent of the effects of agricultural land conversion, urbanization, grazing, roads, oil and gas development, and fragmentation of habitat, we find that the destruction, modification, and curtailment of GPD's habitat or range are not significant threats within the montane portion of the range. Agriculture, urbanization, roads, and oil and gas development each currently affect a small percentage of GPD's habitat. Effects of livestock grazing, while widespread, have not resulted in measurable population declines. Further discussion on the threats affecting the species outside the montane portion of the range (outside the range of the candidate entity) can be found in the 12-month finding (February 5, 2008, 73 FR 6660).

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

The GPDs have been historically subjected to recreational shooting and shooting as a form of pest management on ranch and agricultural land; these practices continue under current state regulations. Shooting continues to occur within the montane portion of the GPD range and contributes to the decline of the species when combined with the effects of disease (see Factor C below). Colorado, Utah, and Arizona (outside Tribal lands) have implemented seasonal closures on prairie dog shooting on public lands. State closures occur from approximately March 1 through June 14. In Arizona and New Mexico, the Navajo Nation monitors this threat but currently implements no closures on shooting because it finds the level of shooting to be low on its lands (Cole 2007, p. 4). This threat is being managed by the States of Arizona and Colorado and modeling results suggest the seasonal shooting closures implemented in Colorado will likely reduce population-level losses on public lands (CDOW 2009, p. 84). Unregulated recreational shooting on private lands could reduce GPD densities on private lands and slow population recovery rates following plague or other disturbances. However, there is a general lack of reliable monitoring data to determine the current levels of shooting on private or public lands (CDOW 2009, p. 165). While we recognize that recreational shooting results in individual animal mortality , we cannot accurately assess the impacts of shooting and cannot definitively state that shooting is a threat to the species. We have determined that overutilization for commercial, recreational, scientific, or educational purposes is not a significant threat to the GPD within the montane portion of its range.

C. Disease or Predation

The GPD is affected by sylvatic plague, which occurs in regular outbreaks and causes population declines and extirpations. Plague is an exotic disease foreign to the evolutionary history of North American species (Barnes 1982, p. 238; Barnes 1993, p. 29; Biggins and Kosoy 2001, p. 907). This flea-borne disease, caused by infection with the bacterium *Yersinia pestis,* is shared by humans and other vertebrate animals. Rodents are the primary vertebrate hosts of *Y. pestis,* but other mammals can be infected. *Y. pestis* is transmitted to mammals by bites of infected fleas, direct contact with infected animals, and rarely by inhalation of infectious respiratory droplets from another animal (Gage et al. 1995, pp. 695-696). Plague was first observed in wild rodents (termed sylvatic plague) in North America near San Francisco, California, in 1908 and was detected in GPDs in the 1930s (Eskey and Hass 1940, p. 6). Plague has subsequently spread so that it now encompasses the entire range of the species (Centers for Disease Control 1998, p. 1; Cully 1989, p. 49; Girard et al. 2004, p. 8408). Therefore, it has only been present within the

species' range for approximately 70 years, allowing very little time for any resistance to evolve (Biggins and Kosoy 2001, p. 913). Once established in an area, plague becomes persistent and periodically erupts, with the potential to eventually extirpate or nearly extirpate entire colonies (Barnes 1982, p. 255; Barnes 1993, p. 28; Cully 1989, p. 51; Cully et al. 1997, p. 711; Fitzgerald 1993, pp. 52–53). The term "enzootic" describes plague existing at a less severe level, sometimes referred to as a "maintenance" condition, that is present continuously throughout a species' habitat; the term "epizootic" describes a severe plague outbreak or amplification transmission cycle (Gage et al. 1995, p. 696). Prairie dogs are highly susceptible to plague, and this susceptibility is thought to be a function of high population densities, abundant flea vectors, and uniformly low resistance (Biggins and Kosoy 2001, p. 913). The GPDs can experience mortality rates of greater than 99% during epizootics, and eradication of populations can occur within one active season (Lechleitner et al. 1962, pp. 190–192; 1968, p. 736; Rayor 1985, p. 194; Cully 1989, p. 49).

Several well-studied colonies within the montane portion of the GPD range have been documented as being extirpated, or nearly so, due to plague. The South Park, Colorado, population area included estimated occupied habitat of 915,000 ac (371,000 ha) in 1945; 74,000 ac (30,000 ha) in 1948; and 42 ac (17 ha) in 2002 (CDOW 2007). This decline was largely due to plague and affected a substantial portion of the species' extant occupied habitat in Colorado (at least 15%). Plague resulted in the complete loss, over a 2-year period, of a colony within the South Park population area (Fitzgerald 1970, pp. 68-69). A plague event in Saguache County, Colorado, that progressed across seven colonies in 2 years left only scattered individuals surviving in two colonies (Lechleitner et al. 1968, p. 734). In Gunnison, Saguache, and Montrose Counties, Colorado, plague also was responsible for a decline from 15,569 ac (6,228 ha) of occupied habitat in 1980, to 770 ac (308 ha) in 2002 (Capodice and Harrell 2003, pp. 5-7). A complete die-off of a colony due to plague in Chubbs Park, Chaffee County, Colorado, occurred in 1959 (Lechleitner et al. 1962, p. 185). In August 1958, the population was stable and healthy, but in 1959 an epizootic spread 2 mi (3 km) within 3 months; prairie dogs continued to be absent from the area in 1960 and 1961, and we have no recent information on the existence of prairie dogs in that location.

Approximately 1,000 to 1,500 GPDs were killed by an outbreak of plague in a 148-ac (60-ha) colony in Curecanti National Recreation Area near Gunnison, Colorado, in 1981 (Rayor 1985, p. 194). A few animals survived the disease and GPDs were again abundant in the area in 1986 (Cully 1989, p. 49). In 2002, 252 ac (102 ha) of habitat in the Recreation Area were occupied by GPD colonies (Capodice and Harrell 2003, p. 23), but the current estimate is 12 ac (4.8 ha) (Childers 2007, p. 2). Colonies within the Recreation Area experienced six plague epidemics between 1971 and 2007. Of the nine historic GPD colonies, three are currently active, and two of these active colonies act as source populations for the main prairie dog concentration area (Childers 2007, p. 1). If the source colonies die off due to plague, repopulation may not be possible because any other GPD populations remaining will be separated by distance (more than 6 mi (10 km)) and impassable geographical features such as rivers and mountains (Lomolino et al. 2003, p. 116).

Recently, plague has been implicated in the loss of several large colonies on Bureau of Land Management land within the Gunnison, Colorado, population area (CDOW 2007, p. 4). A large colony southeast of Gunnison that was very active in 2005 was totally devoid of prairie dogs in 2006 and 2007. Four other large colonies in the same vicinity were active in 2006, but by 2007, no prairie dog activity was observed. Plague is the suspected cause of these extirpations because of the complete elimination of the prairie dogs with no sign of poisoning (CDOW 2007, p. 4).

Fitzgerald (1993, p. 52) expressed concern about the status of the GPD in Colorado, indicating that plague had eliminated many populations, including almost all of the populations in South Park. He also suggested that populations appeared to be in poor condition in the San Luis Valley and were extirpated from the extreme upper Arkansas River Valley, as well as Jefferson, Douglas, and Lake Counties. These areas comprise most of the GPD montane habitat in Colorado.

From 1984 through 1987, a plague event reduced the population of GPDs in the Moreno Valley of New Mexico from more than 100,000 individuals to between 250 and 500, a decline of greater than 99% (Cully et al. 1997, pp. 708-711). Although the remaining population rebounded (increased in size to a certain extent) following the epizootic, another plague event swept through the area in 1988, and the population in July 1996 was still only a small fraction of what it had been in 1984 (Cully et al. 1997, p. 717).

Occupancy modeling performed for Colorado in 2005 indicated a lower proportion of occupancy in the montane portion of the species' range within Colorado (3.2%) than in the prairie portion within Colorado (16.0%) (Andelt et al. 2006, p. 17; CDOW 2007, p. 19). When the study was repeated over the same plots in 2007, occupancy was again found to be lower (3.6%) in the montane range portion in Colorado than in the southwestern portion (18.3%) (CDOW 2007, p. 19). The only recent threat responsible for whole population declines and extirpations, as documented in the studies cited in this section, is plague.

The frequency of plague epizootics appears to be high in montane habitat due to moister environmental conditions that are conducive to greater flea densities. The impact of plague epizootics in montane habitat is great because the small, isolated populations cannot recolonize. Within the South Park, Gunnison, and Southeast montane population areas in Colorado, no prairie dog complexes of appreciable size exist, and only a few small complexes exist within the San Luis Valley population area (CDOW 2007, pp. 1-17). Without a metapopulation structure, an overall decline in persistence takes place (Lomolino and Smith 2001, p. 942).

The landscape status in the montane portion of GPD range is characterized by fewer, smaller colonies that are isolated, and few to no complexes or metapopulation structure. These factors make the prairie dogs in this habitat highly susceptible to plague-related declines, and we have no evidence of recovery from plague to previous population levels in the montane habitat area.

The studies cited above document the serious impact that plague has on GPDs within the montane portion of the range. Plague antibodies have been found in some individuals which indicates they were exposed to plague and survived an infection (Underwood 2007, p. 20). However, this apparent resistance to plague is very limited as periodic plague outbreaks

generally kill more than 99% of the population (Cully et al. 1997, p. 711). Whether individual populations recover from these epizootics depends on two main factors: 1) The availability of other source populations to recolonize an area; and 2) the frequency of epizootic outbreaks, which can reduce population numbers more quickly than individual prairie dogs from neighboring colonies can recolonize.

Populations in the more mesic montane areas of GPD range appear to have been widely and severely affected by plague. This may be partly due to climatic conditions, such as higher levels of spring moisture, which has been shown to increase flea numbers, and in turn, plague outbreaks. Isolation of prairie dog populations does not seem to protect them from the spread of plague, because it appears that plague exists within all parts of the montane range at some level and can be spread by wider-ranging animals. The case studies cited in this section indicate that large populations have been repeatedly affected by plague and have shown no substantial recovery over long periods of time—decades in some cases. This has left smaller, more scattered populations throughout the montane range portion, with the result that areas affected by plague are less likely to be recolonized by nearby populations. While little information is currently available on prairie dog movement within this montane habitat, its geography (populations are located in valleys between mountainous areas) probably impedes the ability of prairie dogs to recolonize populations. Within the Colorado portion of the montane portion of the species range, CDOW found slightly more than 3% occupancy of surveyed plots (CDOW 2007, p. 19).

Populations within montane habitat have three distinct disadvantages in resisting the effects of plague:

(1) A higher frequency of epizootics due to the moister montane climate that is conducive to higher abundance of fleas that spread plague;

(2) Smaller populations that cannot recover in numbers from plague epizootics; and

(3) Isolated populations and no metapopulation structure, due to reduced population sizes from past plague epizootics and montane geography, and therefore a significantly limited ability to recolonize.

After assessing the best available science on the magnitude and extent of the effects of plague, we find that plague is significantly impacting the species in the montane portion of its range.

D. The Inadequacy of Existing Regulatory Mechanisms

On the basis of a review of existing information, it does not appear that the inadequacy of existing regulatory mechanisms is a significant threat to the GPD. However, the percentage of private lands within the montane portion of the species' range results in a paucity of regulatory mechanisms that potentially result in increased shooting and poisoning and some habitat loss, which exacerbate the effects of plague in that portion of its range. We do not have sufficient data to show that shooting is a threat on public or private lands. We do not consider regulatory mechanisms as an effective means of controlling plague in GPDs.

E. Other Natural or Manmade Factors Affecting Its Continued Existence

Poisoning could have a negative effect on small, isolated populations, particularly in conjunction with disease and shooting; therefore, poisoning in the montane area may be more likely to contribute to the decline of the species by further fragmenting the small populations and curtailing recolonization. However, while poisoning bears monitoring, at this time, we conclude that it is not significantly affecting the populations within this portion of the range. No information currently indicates that drought negatively affects, or is likely to affect, the GPD within the montane portion of its range, or that climate change will affect the species within the foreseeable future; however, various scenarios are plausible.

Wyoming ground squirrels (*Spermophilus elegans*) are increasing their range in areas previously occupied by GPDs potentially as a result of Wyoming ground squirrels being more resistant to plague than are GPDs (CDOW 2010b, pp. 4-5). This may infer a competitive advantage to Wyoming ground squirrels over GPDs resulting in reduced recovery rates, or replacement, of GPDs after plague events.

We conclude that no other natural or manmade factors are a significant threat to this species, at this time, throughout the montane portion of its range.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

1. The U.S. Geological Survey National Wildlife Health Center has received funding to: 1) determine the efficacy of oral immunization against plague in Utah prairie dogs by using a vaccine and baits previously tested in black-tailed prairie dogs, 2) determine if vaccine-laden bait provides protection against plague, and 3) evaluate bait uptake (without vaccine) by Utah prairie dogs in the field. The first two of the aforementioned tasks are anticipated to be completed by the end of 2010. The third task is anticipated to be completed in the summer of 2010. It is likely that other prairie dog species, such as GPDs, would respond similarly.

2. The University of Missouri and the State of Utah, along with several other project proponents propose to evaluate a newly developed systemic, oral flea control bait, which when consumed by prairie dogs could reduce flea abundance and have mitigating effects similar to those of topical insecticides on the reduction of plague vectors (fleas). Broad-scale application strategies also will be evaluated. The project will be conducted in black-tailed prairie dog colonies on the Rocky Mountain Arsenal in Colorado, and on Utah prairie dog colonies in southwest Utah. Bait application, site preparation, and monitoring began in the spring of 2009 and will continue in 2010. If successful, this project has the potential to provide another management tool that will reduce the risk of plague outbreaks over larger areas at a fraction of the cost of topical insecticides and become a valuable tool in protecting declining prairie dog populations throughout their ranges.

3. The CDOW collected genetic samples in 2008 and 2009 in several populations of GPD to further clarify genetic issues related to the purported subspeciation issue within GPD (CDOW 2010a, p. 1). Additional samples will be collected in Arizona, Utah, and New Mexico in 2010. The final results of this study are expected in 2011.

4. The CDOW is proposing to preemptively conduct applications of deltamethrin insecticide (dusting) at priority GPD colonies in Colorado in 2010 (CDOW 2010a, p. 7). The intent of this effort is to reduce flea populations at the colonies, thus reducing the risk of plague epizootics in GPDs. This effort will contain a research component implemented by the CDOW Wildlife Health Program that will attempt to determine the effect of dusting on overall flea abundance, flea abundance on prairie dog hosts, flea species composition, and duration of effects.

5. The CDOW has developed draft action plans for all six individual GPD population areas in Colorado. These action plans were developed from workshops held in 2009 and early 2010 (CDOW 2010b, entire). Workshop participants included interested stakeholders who reviewed and ranked issues affecting GPDs. Participants then ranked potential conservation strategies taken from Colorado's GPD and White-tailed prairie dog Conservation Strategy and selected the top two strategies for implementation. The action plans will be valid for 3 to 5 years.

SUMMARY OF THREATS (see February 5, 2008, 12-month finding (73 FR 6660) for a more detailed description of these threats)

Summary of Factor A

After assessing the best available science on the magnitude and extent of the effects of agricultural land conversion, urbanization, grazing, roads, oil and gas development, and fragmentation of habitat, we find that the destruction, modification, and curtailment of GPD's habitat or range are not significant threats on a landscape scale but may be having local impacts. Agriculture, urbanization, roads, and oil and gas development each currently affect a small percentage of GPD habitat. Effects of livestock grazing, while widespread, have not resulted in measurable population declines. However, we need more information on the impacts of fragmentation and isolation with regard to persistence of prairie dog populations and on the magnitude of the potential threat posed by increasing oil and gas development, particularly when considered with the effects of plague on the species viability.

Summary of Factor B

We have determined that shooting continues to be a potential threat to the GPD throughout all of its range, including the montane portion, and contributes to the decline of the species when combined with the effects of disease (see Factor C below). However, with the exception of New Mexico, this threat is being monitored and managed in all states and the Navajo Nation, and modeling results suggest seasonal shooting closures implemented in Colorado and Arizona will likely reduce population-level losses. Therefore, we have determined that overutilization for commercial, recreational, scientific, or educational purposes is not a significant threat to the GPD.

Summary of Factor C

Although plague antibody titers have been found in a few individuals, periodic epizootic plague events generally kill more than 99% of an affected population. Whether individual populations recover from these epizootics depends on two main factors: 1) the availability of other source populations to recolonize an area; and 2) the frequency of epizootic outbreaks, which can reduce population numbers more quickly than individual prairie dogs from neighboring colonies can recolonize.

Populations in the more mesic montane areas of GPD range appear to have been widely and severely affected by plague. This may be partly due to climatic conditions such as higher levels of spring moisture, which has been shown to increase flea numbers, and in turn, plague outbreaks. Documented population declines due to plague outbreaks also occur in the more xeric prairie portions of GPD range; however, evidence shows that many of these populations recover more rapidly from plague epizootics, probably due to the availability of nearby colonizers. Isolation of prairie dog populations does not seem to protect them from the spread of plague, because it appears that plague exists within all parts of the montane range at some level, and can be spread by wider-ranging animals. The case studies discussed above indicate that large populations have been repeatedly affected by plague and have shown no substantial recovery over long periods of time—decades in some cases. This has left smaller, more scattered populations throughout the montane range portion and a complete lack of metapopulation structure, with the result that areas affected by plague are less likely to be recolonized by nearby populations. While little information is currently available on prairie dog movement within this montane habitat, its geography (populations are located in valleys between mountainous areas) probably impedes the ability of prairie dogs to recolonize populations. Within this geographic area, CDOW found slightly more than 3% occupancy of surveyed plots.

Within the montane portion of the range, plague has significantly reduced the number and size of populations, resulting in considerable effects to the species. Populations within montane habitat have three distinct disadvantages in resisting the effects of plague: 1) A higher frequency of epizootics due to the moister montane climate that is conducive to higher abundance of fleas that spread plague; 2) smaller populations that cannot recover in numbers from plague epizootics; and 3) isolated populations and no metapopulation structure, due to reduced population sizes from past plague epizootics and montane geography, and therefore a significantly limited ability to recolonize.

After assessing the best available science on the magnitude and extent of the effects of plague, we find that the impact of plague in the montane portion of the GPD range is significant.

Summary of Factor D

Based on a review of the available existing information, it does not appear that the inadequacy of existing regulatory mechanisms is a significant threat to the montane range portion of GPD. Since 44% of the montane portion of the species' range occurs on private lands, there is the potential that regulatory mechanisms are lacking on non-Federal lands. However, basic information on the level of shooting on private as well as public lands is needed to adequately

assess how regulatory mechanisms address this potential threat. Regulatory mechanisms do not currently reduce the effects of plague on GPD and we believe it unlikely that regulatory mechanisms will ever be an appropriate means of controlling plague. We have no data to show that the loss of habitat to agriculture, urbanization, grazing, roads, or oil and gas development is a threat to the species. Since loss of habitat is not a threat to the species at this time, we believe the absence of regulations addressing habitat loss is not a threat to the species.

Summary of Factor E

Although poisoning contributed historically to large declines in occupied area of GPDs, there is no information available to indicate that poisoning occurs at more than a localized scale today. Poisoning could have a negative effect on small, isolated populations, particularly in conjunction with disease and shooting; therefore, poisoning in the montane area may be more likely to contribute to the decline of the species by further fragmenting the small populations and curtailing recolonization. No information currently indicates that drought negatively affects or is likely to affect the GPD throughout its range, or that climate change will affect the species within the foreseeable future. While poisoning of GPDs and the effects of climate change in the montane portion of the range are issues important to monitor, we conclude that no other natural or manmade factors are a significant threat to this species, at this time, throughout all or a significant portion of its range. Wyoming ground squirrels are increasing their range in areas previously occupied by GPDs thus resulting in reduced recovery rates, or replacement, of GPDs after plague events.

RECOMMENDED CONSERVATION MEASURES

- Develop a plague monitoring program throughout the montane portion of the species range.
- Continue research on systemic flea control and vaccine-laden baits.
- Continued occupancy modeling throughout the species range.
- Develop intensive population monitoring protocols in specific limited areas of management emphasis to supplement occupancy modeling efforts in determining management direction and efforts.
- Continue to implement seasonal shooting closures and develop a system that monitors prairie dog mortality and population level effects as a result of recreational shooting .
- Develop a system that monitors the use of poisons and the effect on GPD populations.
- Continue genetic research on purported subspeciation of GPD.
- Develop monitoring system to track loss of habitat to ensure loss of habitat is not a threat to the species.
- Continue to investigate the impacts of Wyoming ground squirrels on GPD persistence.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	2
		Subspecies/population	**3**
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

RATIONALE FOR LISTING PRIORITY NUMBER

Magnitude: High
We determined that the magnitude of threats affecting the GPD in the montane portion of its range is "high," because plague is significantly affecting the remaining small, isolated populations, and plague epizootics can extirpate populations within a short timeframe (3 to 10 years).

Imminence: Imminent
We find that the threat posed by plague is "imminent" because plague epizootics are known to be occurring and the effects are measurable throughout the montane portion of the species range.

YES Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? NO. We reviewed the available information to determine if existing and foreseeable threats to the GPD within montane habitat are of sufficient extent and magnitude to require emergency listing as threatened or endangered. We have determined that an emergency listing is not warranted for this species at this time, because populations are currently not threatened in the prairie portion of the range, and because emergency listing would not lessen the effects from plague, which is the significant threat in the montane portion of the range.

DESCRIPTION OF MONITORING

According to individual state reports from the Western Association of Fish and Wildlife Agencies Prairie Dog Conservation Team meeting in November 2008, Colorado and New Mexico conducted occupancy modeling surveys in 2007 and will continue to conduct occupancy modeling every 3 years, with the next monitoring efforts scheduled for the spring/summer of 2010. However, it is notable that the timing of the occupancy modeling surveys conducted in

2007 in New Mexico occurred in the fall, which was a deviation from the recommended spring/summer survey period. The occupancy modeling method has proven to be the most efficient and repeatable survey method for GPDs. It is expected that future occupancy modeling surveys would detect a 20% reduction in occupancy with a statistical power of 90% (Andelt et al. 2009, p. 43). The Western Association of Fish and Wildlife agencies held a workshop in February 2010 to evaluate the various monitoring techniques currently in use for prairie dogs for their strengths and weaknesses. A peer review panel is compiling the results of this workshop and the final report is anticipated by June 2010.

COORDINATION WITH STATES

Indicate which state(s) (within the range of the species) provided information or comments on the species or latest species assessment: Colorado, New Mexico, Arizona, and Utah through the Western Association of Fish and Wildlife Agencies.

Indicate which state(s) did not provide any information or comments: None.

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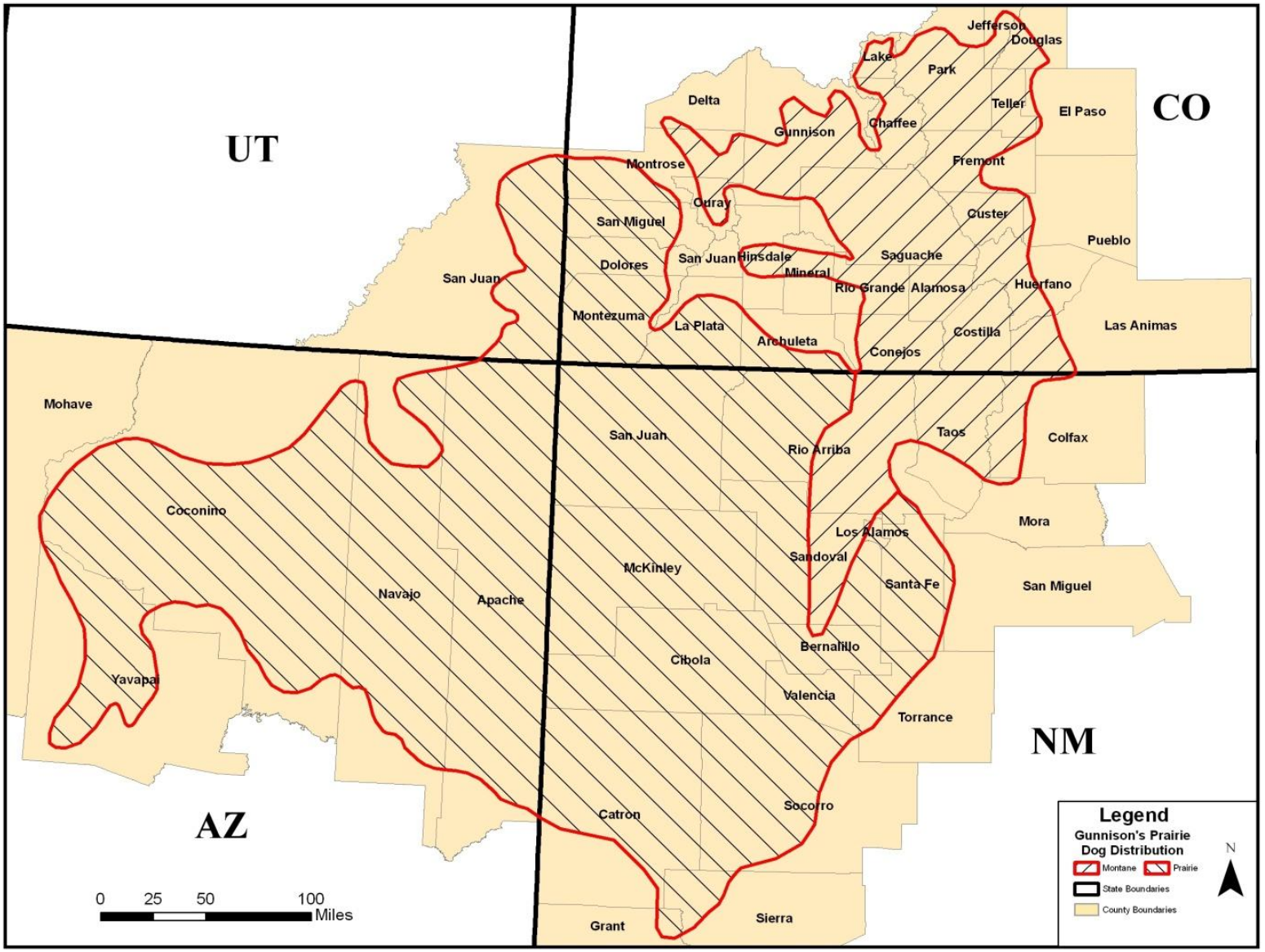
FIGURE 1.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Montezuma
La Plata
Archuleta
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Los Alamos
Sandoval
McKinley
Santa Fe
San Miguel
Navajo
Apache
Bernalillo
Cibola
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Gunnison's Prairie Dog Distribution
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N

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve: _____ 5/26/10
Deputy Regional Director, Fish and Wildlife Service — Date

Concur: _____
ACTING
Director, Fish and Wildlife Service — Date: October 22, 2010

Do not concur: _____ _____
Director, Fish and Wildlife Service — Date